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International cooperation and relevant education

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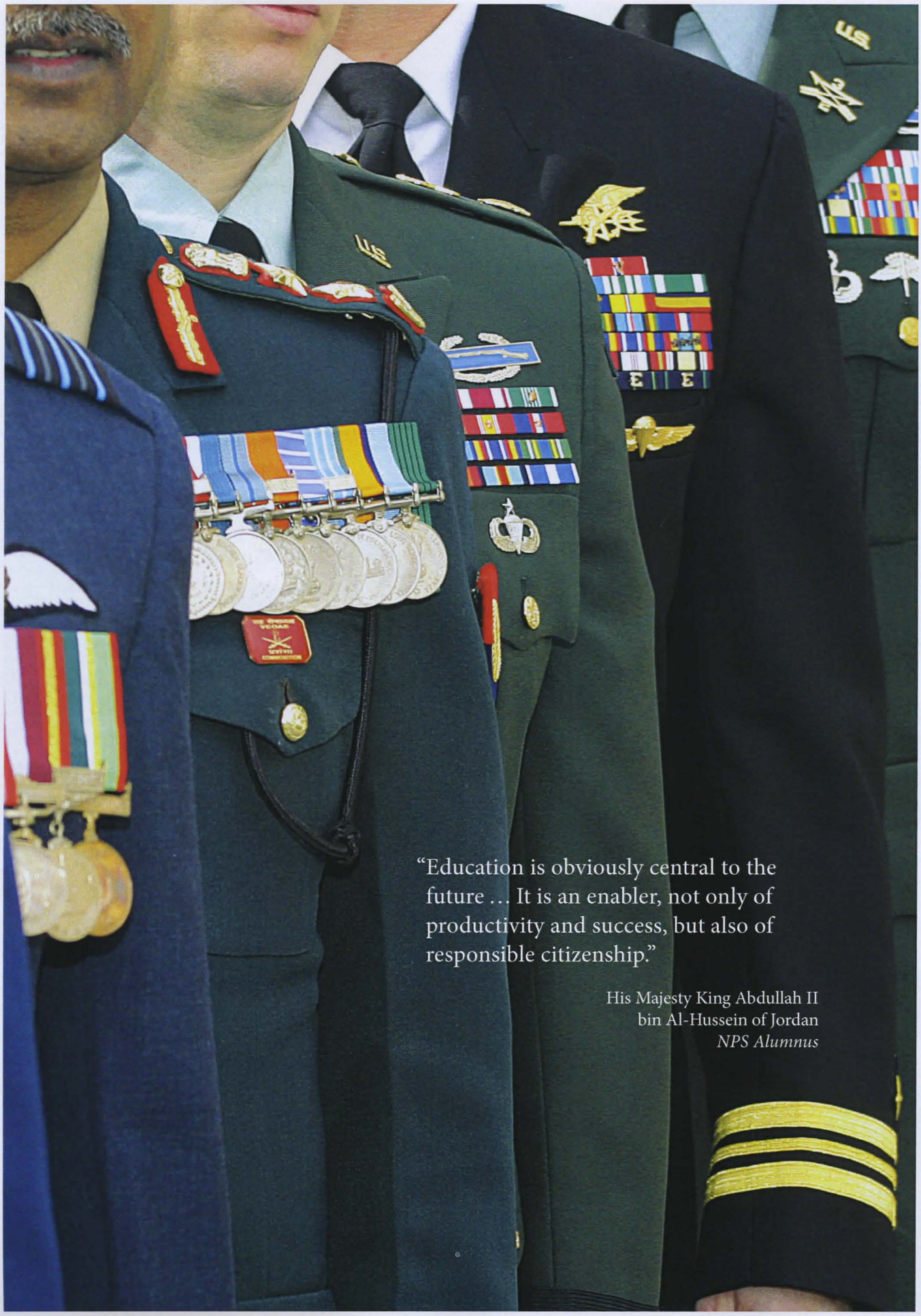
INTERNATIONAL COOPERATION AND RELEVANT EDUCATION

NAVAL POSTGRADUATE SCHOOL

A WORLD OF INNOVATION, ANCHORED IN OPERATION

THE NAVAL POSTGRADUATE SCHOOL PRESENTS A SELECT GROUP OF INTERNATIONAL STUDENTS WITH A ONE-OF-A-KIND OPPORTUNITY IN GRADUATE EDUCATION AND RESEARCH. NOWHERE ELSE ARE DEFENSE-FOCUSED CURRICULA AND ADVANCED RESEARCH INFUSED WITH A RICH ACADEMIC HERITAGE. AT NPS, A WORLD OF INNOVATION, ANCHORED IN OPERATION, AWAITS THE WORLDWIDE DEFENSE AND SECURITY COMMUNITY.



"Education is obviously central to the future … It is an enabler, not only of productivity and success, but also of responsible citizenship."

His Majesty King Abdullah II
bin Al-Hussein of Jordan
NPS Alumnus

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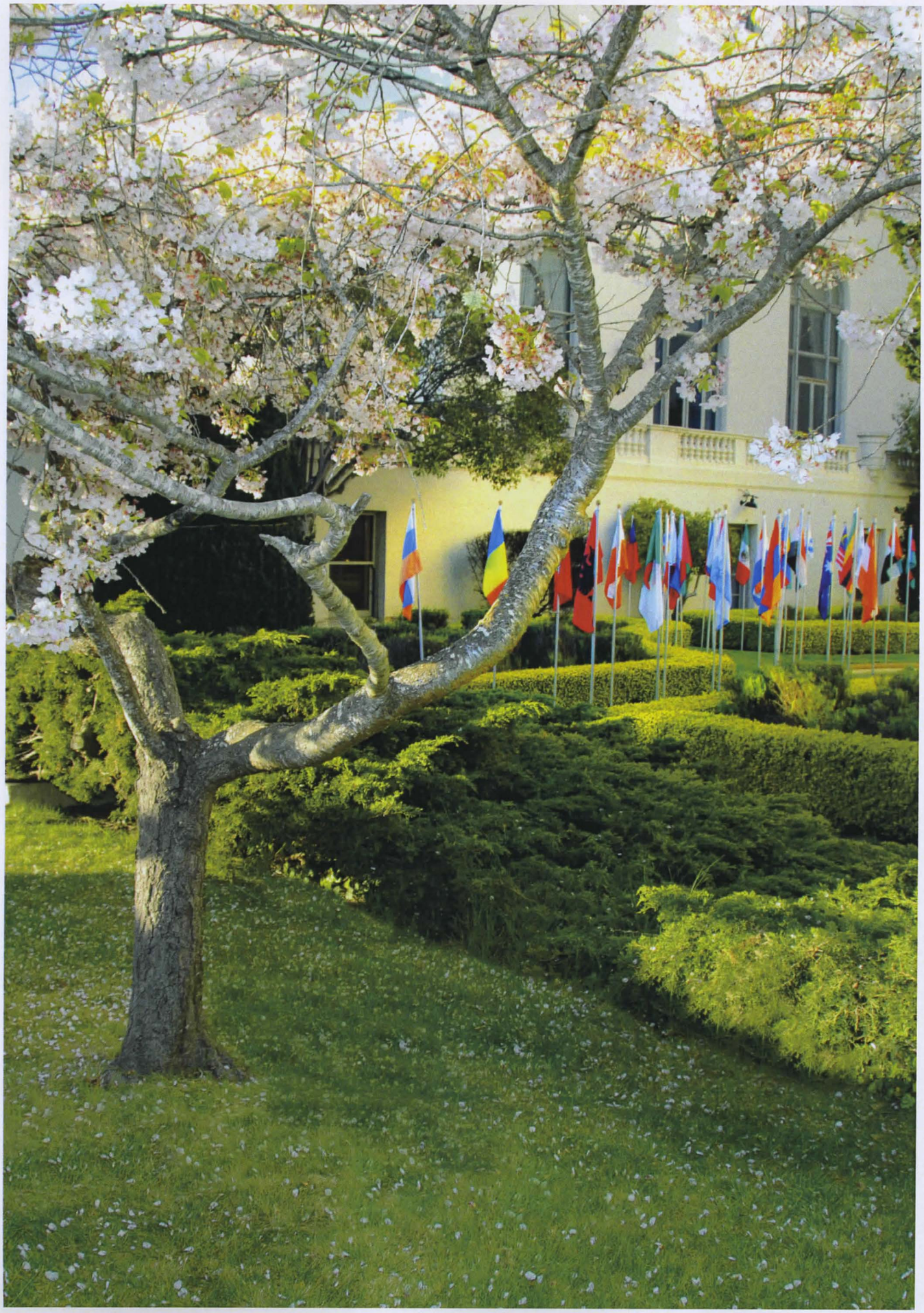


A PLACE FOR INTERNATIONAL COOPERATION AND RESPECT

For challenge and inspiration, the Naval Postgraduate School (NPS) looks in one direction, *forward.* The university is shaped by its proven history of game-changing leadership, superior graduate-level research and education in diverse disciplines, and relevant exploration in national and international security and defense. This makes NPS one of the most unique, real-world focused and ground-breaking research universities in the world.

Based in Monterey, on the California Central Coast, NPS serves an extraordinary student body of officers from joint military and intelligence services personnel to civilian employees of state and local governments, from over 110 nations worldwide. NPS is fully accredited and offers more than 60 unique degree programs at the masters and doctoral levels, all meeting the very highest academic standards. NPS also offers distance learning curricula and certificate programs.

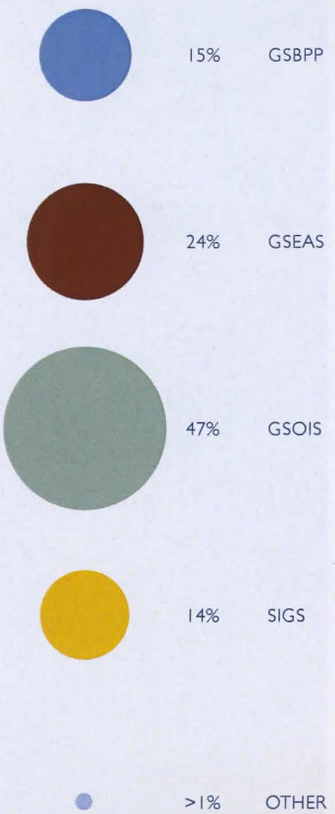
The international program at NPS serves as an integral link in establishing long-term military-to-military relationships between the United States and international officers. Many of our international graduates have gone on to achieve positions of prominence within their military services, governments and private industry.

The demand-driven applied research explores diverse, complex and emerging challenges in our rapidly progressing world. The relevant education is at the forefront of current knowledge to expand our understanding from the deepest oceans and furthest reaches of space, to the intricacies of political science and public policy. All programs contain a military application focused on increasing the combat effectiveness of international armed forces and coalition partners, and support the unique and emerging requirements of the defense establishment.

The Naval Postgraduate School's research endeavors continue to grow more responsive and relevant to international security and defense. Our multidisciplinary programs continue to evolve in both scholarly prowess and fiscal impact, and result in discoveries rivaling prestigious universities across the world.

What follows is a brief snapshot of just a handful of those discoveries, and the students from nations around the globe that are leading the innovation. While each program is unique, each discovery a significant milestone all its own, every student experience at NPS is bound by a single commonality ... relevance. At NPS, an international campus community empowers a defense education like no other in the world.

INTERNATIONAL DEGREE PROGRAM STUDENTS BY SCHOOL



COLOMBIAN OFFICER UTILIZES CORE LAB METHODOLOGY

On the modern, asymmetric battlefield, friendly and hostile forces are intermixed. There are few uniforms, and loyalties are often divided.

Researchers at the Naval Postgraduate School's Common Operational Research Environment (CORE) Lab have embarked on several innovative programs that allow both intelligence analysts and tactical operators to visualize the battlefield like never before.

The lab's staff is comprised of an eclectic group of researchers that includes interdisciplinary faculty partnered with seasoned special operators with years of boots-on-the-ground experience. Together, they aim to illuminate the "human terrain" by utilizing advanced analytical methodologies.

"There is no other place in the world that teaches these kinds of courses at the graduate level … We offer a truly a unique educational and research opportunity," said Core Lab Co-Director and U.S. Army Green Beret Col. Greg Wilson. "Our faculty and students are utilizing cutting-edge analytical methodologies and analysis tools."

But the lab is not just a research institution. It is a working lab that is producing relevant applications with names like "Lighthouse," "Dynamic Twitter Network Analysis (DTNA)," and "Improvised Explosive Device Network Analysis" (IEDNA). These applications may soon replace outdated intelligence systems and close the gap between intelligence analysts in labs and operators on the ground.

CORE Lab graduate students have the option of bringing in data from their home units or nations for analysis in the lab. This approach ensures that students not only receive a world-class education, but that they have an understanding of powerful analytical methodologies that can be applied when they return home.

Colombian Army Maj. Carlos Padilla took data from his home nation and was able to identify insurgent networks on the Venezuelan side of his country's border.

"My final assignment for my Geospatial and Temporal Dimensions of Dark Networks class focused on the presence of FARC [Revolutionary Armed Forces of Columbia] camps along the border between Colombia and Venezuela. With open source data, we were able to locate FARC camps inside Venezuela and determined through geospatial analysis the likely locations of two additional FARC logistical camps located on the Venezuelan plains and Colombian Perija mountain range," said Padilla.

Padilla's work was later used to inform South American diplomats at the Organization of American States (OAS) about Venezuelan support of the FARC.

"In April, I returned to Colombia and provided my analysis to the Colombian J2 [intelligence department]. My analysis was used in support of a report delivered by Ambassador Hoyos in an OAS meeting where he denounced Venezuela for supporting the FARC."

POSSIBLE FIELDS OF STUDY

Strategy and Policy

The Dynamics of Inter-State and Intra-State Conflict

Terrorism, Social Revolution and Unconventional Warfare

Historical and Comparative Perspectives on Special Operations

Crisis Management and the Contingent Use of Military Power

Comparative Cases of Response to Religious Conflict

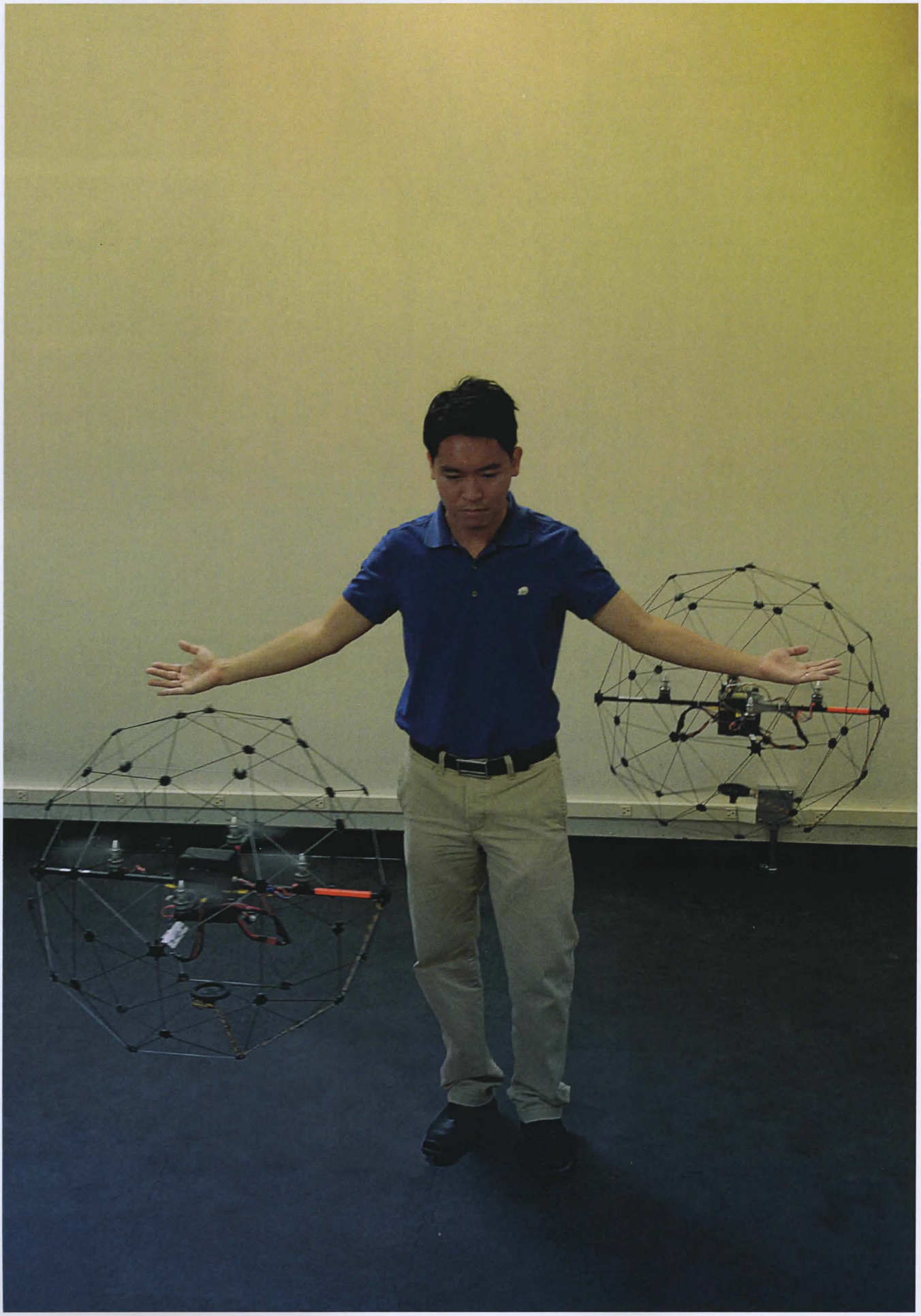
Special Operations and the Revolution in Military Affairs

Special Operations and Information Warfare

Weapons of Mass Destruction Proliferation and Counter-Proliferation

Analytical Methods and Applications

Strategic and Operational Complexity



SINGAPOREAN STUDENT APPLIES INNOVATIVE UAV TECHNOLOGIES

ST Aerospace, one of Singapore's premiere defense technology firms, recently dispatched one of its engineers, Chee Nam Chua, to conduct graduate research on unmanned aerial vehicle (UAV) flight technology at the Naval Postgraduate School.

Chua hopes to utilize UAV flight algorithms developed by NPS Department of Mechanical and Aerospace Engineering Professor, Dr. Oleg Yakimenko, the director of the university's Aerodynamic Decelerator Systems Center (ADSC). If successful, these algorithms will allow Singaporean defense and law enforcement personnel to operate multiple unmanned aircraft in congested urban environments.

"The most important UAV capability that we are developing is Detect, Sense and Avoid (DSA) technology ... UAVs should be able to detect potential threats, avoid collisions and implement an avoiding maneuver," said Yakimenko. "All these steps, up to the generation of an avoidance maneuver, need to be done in a fraction of a second."

Yakimenko's research into UAV flight algorithms and airborne delivery systems is breaking ground in an area that has become increasingly important in the age of asymmetric, modern warfare — warfare that often occurs in populated areas far from the battlefields of the past.

"Military conflicts are shifting from jungles and deserts to cities. This is because terrorists and insurgents find that these areas provide rich target environments and good hideouts," said Chua. "With the use of UAVs, urban threats can be tracked and targeted effectively."

Singapore is a small, but densely populated, urban nation. Its overwhelmingly urban environment demands innovative defense solutions, and Chua and his colleagues aim to harness technology that will allow UAVs to 'instinctively' avoid obstacles in many types of dynamic urban terrain.

"Operators will provide UAVs with a mission area, map, flight and altitude data ... But the dynamic environment requires systems that can avoid obstacles without human direction," said Chua.

"We are employing the Inverse Dynamics in the Virtual Domain (IDVD) method that allows computing feasible spatial trajectories to maneuver in a clutter dynamic environment," said Yakimenko. "It is a proven concept and it has been utilized on-board aerial, ground, surface and underwater vehicles already."

The concept can been seen in action at NPS' Autonomous Systems Engineering and Integration Laboratory where UAVs buzz about the lab, avoiding obstacles and each other.

When perfected, the algorithms developed by Yakimenko and his students will guide more sophisticated aircraft designed to find, reveal and disrupt criminal and terrorist networks.

POSSIBLE FIELDS OF STUDY

Sensors and Actuators

New Materials and Methods

Mechanics of Materials

Laser and Material Interaction

Autonomous Underwater Vehicle Research

Energy Harvesting and Storage

Turbo Propulsion

Spacecraft Research and Design

Aerodynamic Decelerator Systems

Survivability and Lethality


PLEASE DO NOT TOUCH
FACTORY SETTING OF
STA 449 F3

NPS INJECTS NEW LIFE INTO MATERIALS RESEARCH

The Naval Postgraduate School's Center for Materials Research (CMR) was born out of collaborative measures between faculty and administrators to meet the materials challenges of a modern naval force.

Distinguished Professor Emeritus, Dr. Terry R. McNelley and Distinguished Professor, Dr. Nancy Haegel spearheaded an effort to bring together scholars from across the academic spectrum to create the CMR.

"The need for sensors and new materials is very important to the fleet," said Haegel. "The Navy's needs drove our desire to hire new researchers from a variety of disciplines that could work across the varied fields that encompass materials research."

"The emergence of the center has enabled us to work across department boundaries and we have managed to strengthen materials activities here at NPS, " said McNelley. "We no longer work in isolation. We have found ways to pull together. You could say that the sum of what we have done is much greater than its individual parts."

Those "individual parts" include a host of new faculty recruited to reinvigorate materials research at NPS.

"The reason that the CMR has coalesced in the manner that it has is due to the new people that we have brought in ... They have begun their own research which has led to new ideas and interests beings explored," said McNelley.

Distinguished Professor and CMR Director Dr. Young Kwon, works with the CMR on nanomaterial engineering. His work demonstrates the manner in which the materials sciences have evolved in recent years.

"Sometimes we are looking at materials as small as a few atoms," said Kwon. "Materials behave very differently at the nanolevel when compared to the same materials on the larger scale ... we are synthesizing nanomaterials and looking for new applications."

And these are applications that utilize what is seemingly the stuff of science fiction — nanotubes built at the molecular level, microscopic sensors and even nanonengineered engines. NPS researchers insist that none of these advances would have been possible without a cross-disciplinary approach to materials study.

"We are already showing promise, we have good people doing good research, and we are receiving excellent sponsorship as we seek solutions to the Navy's most pressing material needs," said McNelley.

POSSIBLE FIELDS OF STUDY

Materials Science

Mechanics of Solids

Dynamics of Marine Autonomous Vehicles

Fluid Dynamics, Mechanics

Corrosion

Heat Transfer

Ship Shock and Vibration

INTERNATIONAL DEGREE STUDENTS BY COUNTRY

Students from around the world participate in international programs at the Naval Postgraduate School. From cybersecurity, applied physics and energy science to oceanography, unmanned systems and astronautical engineering, the ever-expanding range of cutting-edge programs and research inspire operationally-experienced students to apply their skills to solving the immediate needs of global security. This map shows the International Program participation by country and highlights award-winning research from the past decade.

Kevin William Buchanan
Canada, Army

DEGREE 2008, M.S. IN APPLIED PHYSICS

THESIS REAL TIME IMAGING ANALYSIS USING A TERAHERTZ QUANTUM CASCADE LASER AND A MICROBOLOMETER FOCAL PLANE ARRAY

Jose M. Gomez Torres
Colombia, Navy

DEGREE 2010, M.S. IN MECHANICAL ENGINEERING AND M.S. IN SYSTEMS ENGINEERING

THESIS WARSHIP COMBAT SYSTEM SELECTION METHODOLOGY BASED ON DISCRETE EVENT SIMULATION

Cesar A. Barria Issa
Mexico, Navy

DEGREE 2010, M.S. IN DEFENSE ANALYSIS

THESIS THE USE OF TERRORISM BY DRUG TRAFFICKING ORGANIZATIONS' PARAMILITARY GROUPS IN MEXICO

Muhammat N. Inuwa
Nigeria, Army

DEGREE 2009, M.A. IN SECURITY STUDIES EAST, SOUTH ASIA, SUB SAHARA

THESIS OIL POLITICS AND NATIONAL SECURITY IN NIGERIA

Mauricio F. Munoz
Chile, Navy

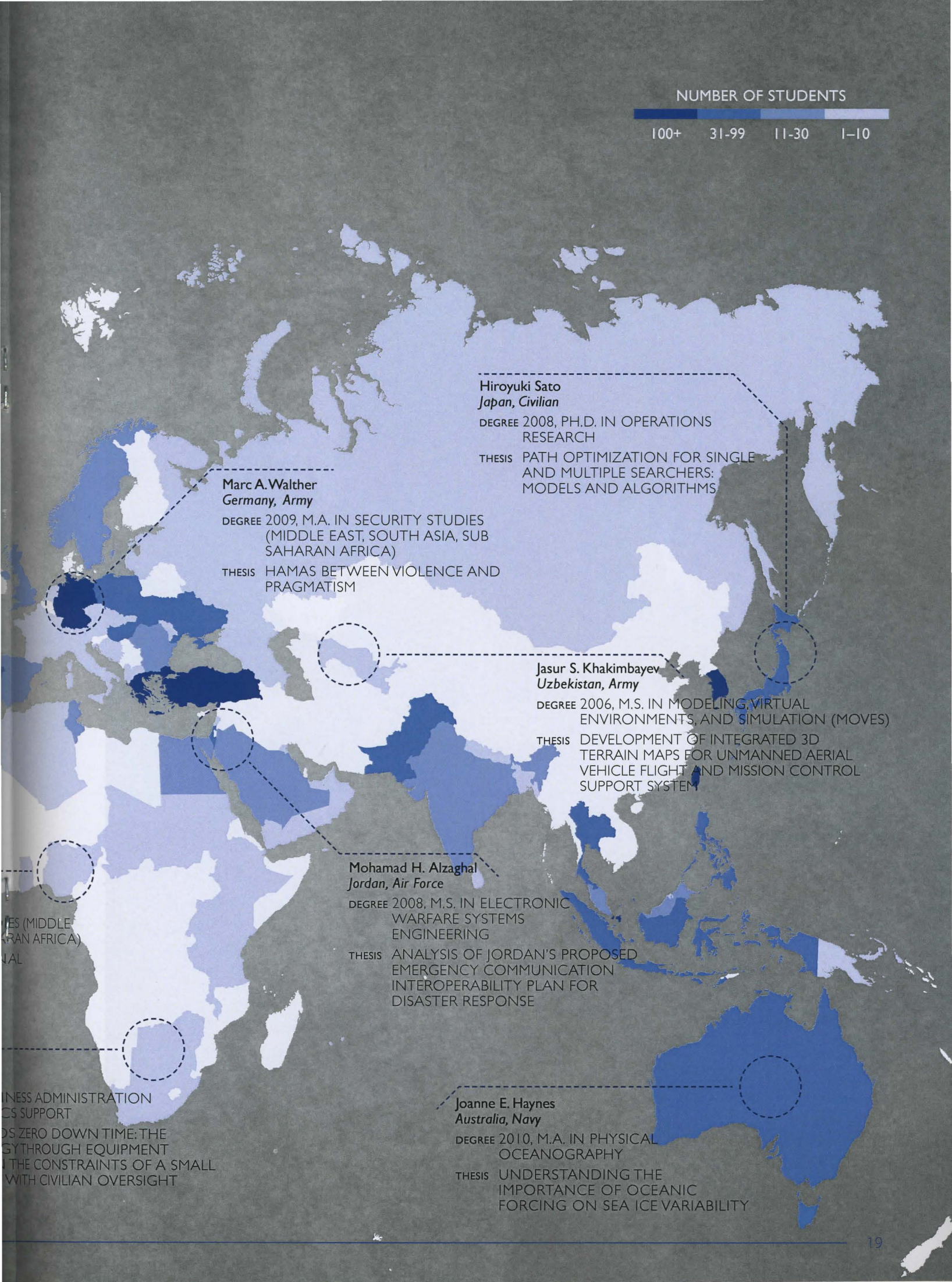
DEGREE 2011, M.S. IN OPERATIONS RESEARCH

THESIS AGENT-BASED SIMULATION AND ANALYSIS OF A DEFENSIVE UAV SWARM AGAINST AN ENEMY UAV SWARM

Mothusi Glendon Mompati
Botswana, Army

DEGREE 2005, MASTER OF BUSINESS IN MATERIAL LOGISTICS

THESIS A FIRST STEP TOWARDS ZI CREATION OF SYNERGY T ACQUISITION WITH THE BUDGET IN AN ARMY IT


NUMBER OF STUDENTS
100+
31-99
11-30
1–10
Hiroyuki Sato
Japan, Civilian
DEGREE 2008, PH.D. IN OPERATIONS RESEARCH
THESIS PATH OPTIMIZATION FOR SINGLE AND MULTIPLE SEARCHERS: MODELS AND ALGORITHMS
Marc A. Walther
Germany, Army
DEGREE 2009, M.A. IN SECURITY STUDIES (MIDDLE EAST, SOUTH ASIA, SUB SAHARAN AFRICA)
THESIS HAMAS BETWEEN VIOLENCE AND PRAGMATISM
Jasur S. Khakimbayev
Uzbekistan, Army
DEGREE 2006, M.S. IN MODELING, VIRTUAL ENVIRONMENTS, AND SIMULATION (MOVES)
THESIS DEVELOPMENT OF INTEGRATED 3D TERRAIN MAPS FOR UNMANNED AERIAL VEHICLE FLIGHT AND MISSION CONTROL SUPPORT SYSTEM
Mohamad H. Alzaghal
Jordan, Air Force
DEGREE 2008, M.S. IN ELECTRONIC WARFARE SYSTEMS ENGINEERING
THESIS ANALYSIS OF JORDAN'S PROPOSED EMERGENCY COMMUNICATION INTEROPERABILITY PLAN FOR DISASTER RESPONSE
Joanne E. Haynes
Australia, Navy
DEGREE 2010, M.A. IN PHYSICAL OCEANOGRAPHY
THESIS UNDERSTANDING THE IMPORTANCE OF OCEANIC FORCING ON SEA ICE VARIABILITY


EME

INDONESIAN DEFENSE UNIVERSITY COMMANDANT ATTENDS DRMI COURSE

Air Vice Marshal Dr. U.H. Harahap, M.S., is the commandant for the Postgraduate School of Defense and Strategy Studies at the Indonesian Defense University (IDU). The IDU is a recently established university that prepares future Indonesian military leaders in the field of strategic environments. Harahap was recently promoted to his current position as the Commandant of this division of IDU.

Harahap traveled to NPS to attend the two-week long Indonesian Defense Management Course in April 2012, held through the Defense Resource Management Institute (DRMI), and presented a plaque to NPS leadership while he was on the campus. During his visit, Harahap expressed his gratitude for the opportunity for the Indonesian students to come study at NPS, and his wish for the continuation of NPS/IDU cooperation and partnership.

Harahap noted that NPS was a significant resource to IDU, especially because his is such a new university. He remarked, "We cooperate with other universities abroad, and also welcome the help that NPS provides with the curriculum, lecturers, and how to build the curriculum itself. We are very thankful for that help. I hope the cooperation between IDU and NPS will continue."

POSSIBLE FIELDS OF STUDY

Defense Management and Analysis

Financial Management

Information Systems Management

Logistics Management

Acquisition Management

Acquisition and Contract Management

Systems Acquisition Management


NPS

SUBMARINE COMMANDER CONGRATULATES NATIONAL AND INTERNATIONAL GRADUATES

An increasingly diverse community of graduates, representing the Navy and all U.S. services, several nations, law enforcement and a large group of civilians, were joined by a packed house of family and friends in celebration of a recent NPS graduation in King Auditorium.

Vice Adm. John M. Richardson — currently serving as Commander, Submarine Forces as well as Commander, Submarine Force Atlantic and Commander, Allied Submarine Command — opened his remarks by thanking the NPS community for the invitation to be guest speaker, and paid the graduating class a high compliment by noting that they "both individually and collectively represent a tremendous addition to the strategic arsenal of our nation."

He commented that this was a milestone day for the Navy, the United States and many international nations as the graduates complete their studies and return to their units, home countries and commands. NPS is not just any graduate school or academic institution, the students here are not focused on just any old issues — but on practical and detailed solutions to real problems that face the Navy and defense.

The relationships that have been built will reach across warfighting domains and nations as you return to operate and fight together, he added, emphasizing the strategic advantage of NPS' international environment. Today's global problems require very comprehensive approaches and solutions that bring their own elements of national and international power, he said.

"You have bonds of friendship and trust already in place that you forged here in Monterey ... You became international strategic thinkers without even realizing it," Richardson said. "Our nation needs you to rise and reach your strategic potential ... Don't forget what you learned here in class and by all means stay in touch and keep those strategic bonds strong."

INTERNATIONAL DEGREE PROGRAM STUDENTS WINTER 2012

Total Students	247
Total Countries	47

Countries Include: Algeria, Argentina, Bahrain, Brazil, Cameroon, Canada, Chile, Colombia, Croatia, Czech Republic, Georgia, Germany, Greece, Hungary, India, Israel, Japan, Jordan, Kenya, Korea, Latvia, Lithuania, Maldives, Malaysia, Moldova, Netherlands, Nigeria, Norway, Nepal, Pakistan, Philippines, Portugal, Romania, Saudi Arabia, Seychelles, Singapore, Sri Lanka, Sweden, Taiwan, Timor Leste, Thailand, Turkey, Tunisia, Ukraine, United Arab Emerites

INTERNATIONAL GRADUATES FROM ALL PROGRAMS WINTER 2012

Total Students	5,463
Total Countries	110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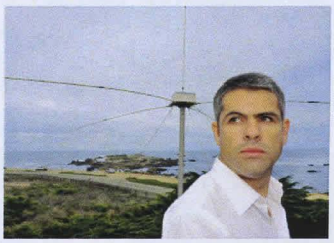


NIGERIAN OFFICER SEEKS UNITY THROUGH EDUCATION

Nigeria is the most populous country in Africa and has the second largest economy. After years of military rule, it has transitioned to civilian government and is working hard to heal the wounds left by the 1967 civil war.

Nigerian Army Lt. Col. Umar Aminu believes that education is the key to national unity and healing in his country. He claims to have been able to break out of the regional mindset that dominates rural Nigerian communities through hard work and education.

"The military education that I received caused a shift in my thinking," said Aminu.

Aminu describes the traditional division of Nigeria as three dominant regions with mistrusts that his countrymen are struggling to overcome. He insists that when people come together through work, education and military experience, old biases can be corrected and unity built. Aminu credits his military training with opening his eyes to a much larger Nigeria.

"Training at the military academy revealed to us that we are all human beings and helped us to strip away our biases," said Aminu. "It helped me to think objectively ... we [Nigerians] worked together, trained together, ate together ... if something happened in one part of the country, we were able to understand the event objectively and begin to seek a solution."

Aminu decided to further his education at the Naval Postgraduate School. He is working toward a graduate degree in regional security studies (sub-Saharan Africa). Upon graduation, he will return to Nigeria to teach at the Nigerian Armed Forces Command and Staff College.

"I will be teaching staff duties, strategic planning and joint operational planning," said Aminu. "NPS has helped me to understand the various countries in the region ... people are the same, but their histories are different. Those histories affect the way they view us and each other."

Aminu speaks more like an educator than a military officer. He is working on a graduate thesis that seeks to create a strategic framework for resolving the conflict between the notorious Boko Haram movement in Northern Nigeria and the government.

"These groups are hinged on poverty and illiteracy. If you told them the Earth was flat and that you would fall off the edge if you go too close, they'd believe it," said Aminu. "It is through education that we will solve these problems."

POSSIBLE FIELDS OF STUDY

Middle East, South Asia and Sub-Saharan Africa

Far East, Southeast Asia and the Pacific

Western Hemisphere

Europe and Eurasia

Civil Military Relations

Stabilization and Reconstruction

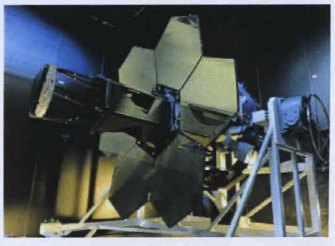
Defense Decision Making and Planning

Homeland Security and Defense

Combating Terrorism, Policy and Strategy


HERRERA
AQUINO

INTERNATIONAL GRADUATE PROGRAM OFFICE



The Naval Postgraduate School is dedicated to providing a welcoming and supportive academic environment for its international student community.

International students studying at NPS are supported by a variety of programs and initiatives overseen by the International Graduate Programs Office (IGPO).

"The IGPO is responsible for the cultural, social and academic integration of the international students and their families into the Naval Postgraduate School, " said Assistant Dean of the School of International Graduate Studies, retired U.S. Marine Corps Col. H. Gary Roser.

Roser has served the international student community at NPS for more than 20 years and has witnessed the evolution of the international student program.

"In December 2012, we passed a significant milestone with over 5,400 international graduates from 110 countries, including our first graduates from Timor-Leste and the Seychelles," said Roser.

The IGPO office works with students and oversees a robust sponsorship program designed to ease the transition of international students into academic life at NPS. As part of the program, each international student is assigned an individual sponsor.

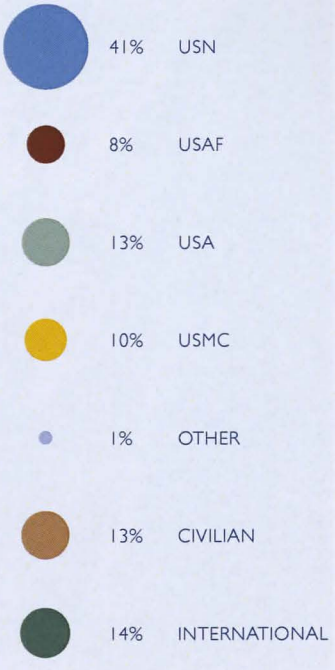
Sponsors contact their international counterparts prior to their arrival at NPS. They meet international students and their families at the airport and help them to adjust to life on the Monterey Peninsula. They also assist incoming students with basic necessities like housing and transportation. Additionally, sponsors are available to help family members to locate schools and markets, and to meet other basic needs.

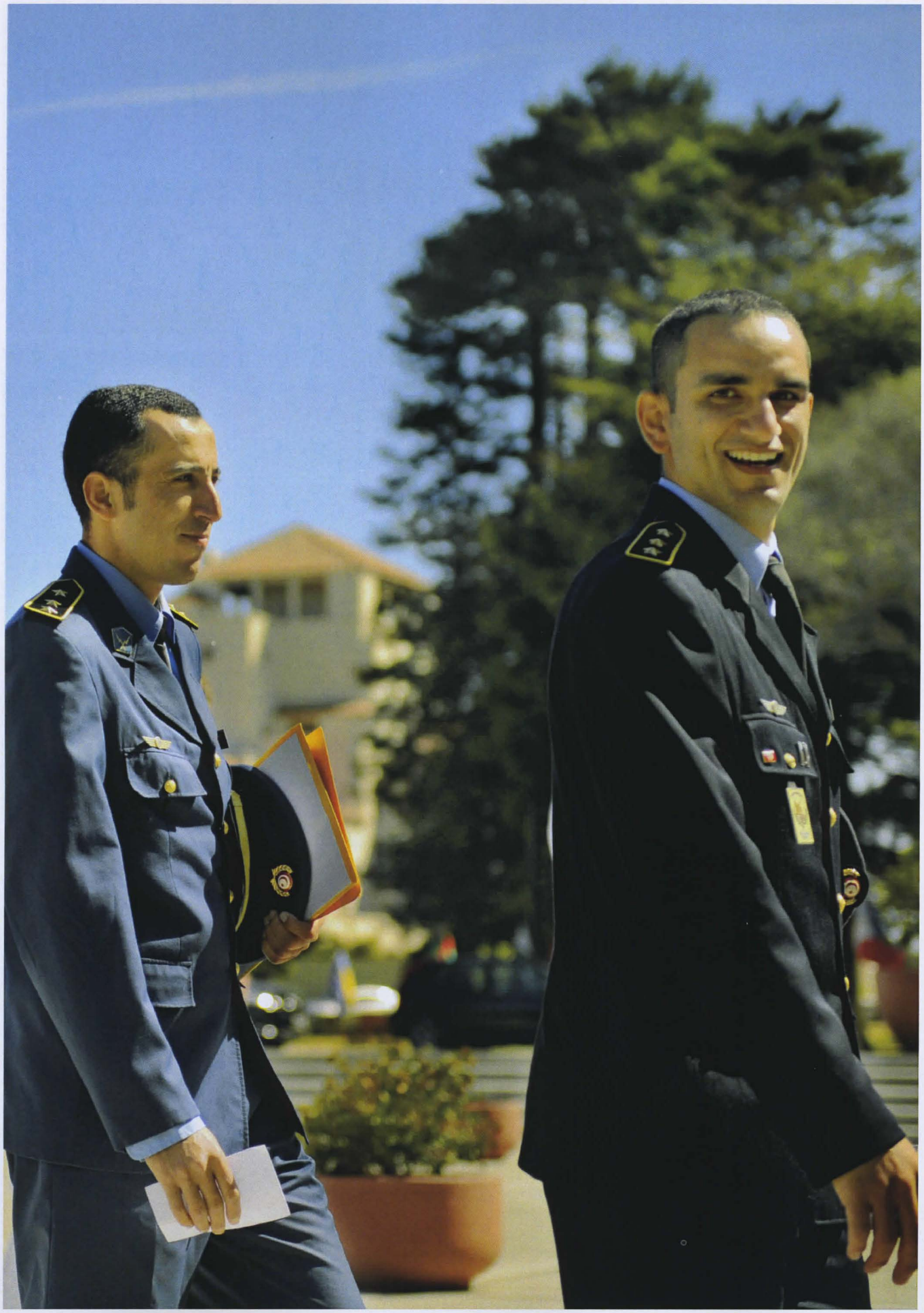
In addition to academic and linguistic support, the IGPO works to expose the international student body to U.S. culture and interesting local events through field trips and outings. IGPO-sponsored outings give international students a glimpse of American life and take advantage of the many cultural offerings available in the Bay Area.

NPS graduates are part of a robust community of current and former students. Many international graduates continue to interact with the university long after they have graduated. NPS offers its graduates lifelong academic access to its many on-line resources and its award-winning research library.

RESIDENT STUDENT ENROLLMENT

2012 Average On Board





INTERNATIONAL STUDENT LIFE AND ACADEMICS

The Naval Postgraduate School currently educates students from over 40 different countries and from the military, government and civilian sectors. International students can choose from a wide variety of course offerings tailored to their home nation's research needs.

With an average class size of only 14 students, international students need not worry about getting lost in the crowd. They will find a faculty population, many of which are international scholars themselves, ready to actively support their research.

"The NPS faculty is highly qualified, they have the right approach and teaching method, particularly in regard to international students," said Pakistan Air Force, Air Commodore Shahid Bajwa.

Bajwa is completing a postgraduate degree in security studies at NPS.

"This education will broaden my global security outlook ... It is helpful to understanding the entire spectrum of security studies. My thesis advisors have been excellent," said Bajwa.

Bajwa came to NPS to earn his third master's degree, but like many international officers, he brings as much to NPS as he takes away. As a general officer in the Pakistan Air Force, he brings a unique perspective to defense-focused graduate studies. He has over 28 years military experience and has taught operational strategy and national security at Pakistan's National Defense University in Islamabad.

It is not only a diverse student body that brings an international perspective to NPS. International faculty members also make unique contributions to the NPS experience.

Associate Professor Dr. Claudia Luhrs began her studies in her home country of Mexico. She overcame the challenges associated with studying in a foreign country and works with her students to do the same.

"Foreign students go through an adaption period. My past educational experience in Mexico was very rigid, so I understand that I must tailor my instruction to meet the learning needs of students from different learning environments," said Luhrs. "I use a variety of teaching methods designed to make the student, not the professor, the focus of the learning process."

International students participate in the same classes and programs as U.S. students, and can conduct research with fellow international or U.S. students.

There are currently 212 international students from 42 countries conducting graduate studies at NPS.

STUDENT FACULTY RATIO

By School

9.6	GSBPP
9.3	GSEAS
11.8	GSOIS
5.9	SIGS

AVERAGE CLASS SIZE

On-Campus by School

19	GSBPP
10	GSEAS
12	GSOIS
13	SIGS

BREAKING THE LANGUAGE BARRIER

NPS instructors go to great lengths to ensure their students' success by combining excellent in-house English as a second language (ESL) instructors with local adult education partners to ensure that the international student body is able to conduct world-class graduate studies in the U.S.

"They [NPS faculty] give us the foundation ... how to read academically, how to cite your work in English," said Turkish Navy Lt. j.g. Fatih Yildiz. "By the time we complete this training, we will be able to do graduate work in English."

ESL instructor Richard Cook of Wichita, Kan. volunteered to leave his position at the Defense Language Institute in San Antonio, Texas to teach at NPS. He is driven by a desire to help his students communicate, and receive the recognition their academic work deserves.

"I want my students to understand that they will be respected for what they say, not how they say it," said Cook. "I encourage my students to 'get in there' and take advantage of the American penchant for being heard and part of the conversation." Cook's approach is part of a strategy developed to help international students and their families to not merely understand English at the academic level, but to understand the subtle nuances of the English language in their cultural context.

Monterey Public Unified School District (MPUSD) Instructor Ron Russell also incorporates cultural training into his ESL curriculum. "When you teach language, you must teach the culture and psychology of the people who speak the target language," said Russell. "For example, levity, irony, sarcasm, slang, and idioms may not seem important to people who think language is just pieces of grammar, but without the humor and street-grit, students will never communicate well or feel comfortable in the U.S."

English courses at NPS are challenging, but instructors insist that their classes are different from typical, grammar focused language studies programs. "I am married to an American service member ... I took a class in [nearby] Pacific Grove, but it was very boring. Here I have learned a lot. We practice speaking together and it works," said Mary Pilkington of Japan.

Cook is quick to share examples of students excelling through his ESL program. "There was a Mongolian officer who came to my class. He was someone who struggled with English, but he persisted. He did not reach perfection, but you don't have to be perfect to be successful ... He had a great attitude and nothing got him down," said Cook. Despite the difficulty associated with studying in a foreign language, international students in Cook's ESL course insist that the benefits of a graduate education at NPS outweigh the sacrifices.

"If I were to do graduate studies in my home country, I would gain a good understanding of South East Asia, but by studying here I am able to gain a global understanding of my field," said Royal Thai Navy Lt. Pakphum Phairotchananan.

POSSIBLE FIELDS OF STUDY

Academic Writing

English as a Second Language

English as a Second Language for Family Members

DEFENSE-FOCUSED RESEARCH AND ACADEMICS

NPS is the world leader in defense-focused graduate education. Students have many options when pursuing graduate education, but when it comes to defense related research, NPS is without peer.

"We collaborate with the best minds in the world, as many top university centers do, but our efforts are focused directly on defense issues, particularly those involving complex, international coalition endeavors. In addition, we have direct access to defense organizations and operations, and our multinational, military student population provides for unique experiences, interactions and friendships," said Center for Edge Power Director, Professor Mark Nissen."

NPS has numerous academic centers, groups and focus areas conducting research in diverse areas. Students can study everything from defense related business practices to spaceship design. Most centers take a multidisciplinary approach with advisors from a variety of complimentary disciplines working together to tackle tough defense related problems. A detailed description of the academic centers and programs available at NPS can be found in our course catalogue. The following samples highlight a few of the cutting-edge research opportunities available at NPS.

NPS is also working on several collaborative research programs with wide-reaching defense applications in the areas of humanitarian assistance, nuclear non-proliferation, oceans systems, acquisition and cyber security.

UNDERSEA WARFARE GROUP

Submariners, aviators and surface warfare officers receive the best possible interdisciplinary undersea warfare education, drawing from mathematics, signal processing, operations research, oceanography, unmanned systems, modeling and simulation, and physics courses.

CENTER FOR LITTORAL COMBAT SYSTEMS

The Navy is currently undergoing a transformation in the littoral warfare arena. Researchers at NPS are working on materials and designs that will allow mariners the ability to operate fast, reliable manned and unmanned watercraft within this critical area.

COMMON OPERATIONAL RESEARCH ENVIRONMENT (CORE)

The CORE program educates students to use advanced analytical intelligence methodologies. The program arms students with the tools to combat the problems of terrorism and networked adversaries.

CONSORTIUM FOR ROBOTIC AND UNMANNED SYSTEMS EDUCATION AND RESEARCH (CRUSER)

CRUSER provides a collaborative environment and community of interest for the advancement of unmanned systems education and research.

CYBER SYSTEMS AND OPERATIONS

Cyber security studies have never been more relevant and NPS researchers are at the forefront of this emerging field. Students study modern threats, networks, detection and defeat strategies.

COMBAT MODELING

Modeling at NPS is conducted in collaborative environments under the direction of experienced operations professionals. NPS developed models have been showcased in international symposiums and have been created in response to challenging requests from defense community sponsors.

CENTER FOR CRITICAL INFRASTRUCTURE PROTECTION

Infrastructure defense studies at NPS are focused on collaborative efforts to defend, harden and protect critical infrastructure. Researchers provide analytical support to local, state and national governments.

CBE/TNT

The research that occurs at NPS is more than just labs and classrooms. Experiments are encouraged between defense agencies, academics and industry. Researchers at NPS work in field environments where the latest technologies, concepts of operations, and human systems integration are evaluated for defense related operations.

"We have managed to break down the traditional stovepipe academic mold and work together across disciplines here at NPS."

Dr. Terry R. McNelley
Distinguished Professor Emeritus,
Naval Postgraduate School

MODELING VIRTUAL ENVIRONMENTS AND SIMULATION (MOVES) INSTITUTE

The MOVES Institute specializes in modeling and simulation projects focused in areas like augmented reality, human behavior simulation, human systems and training, and simulation modeling for analysis.

CENTER FOR DEFENSE MATERIALS RESEARCH

The CMR answers the Navy's materials research needs with an interdisciplinary staff conducting dynamic research in everything from nanotechnology to "shock physics" and composite materials.

CENTER FOR TERRORISM AND IRREGULAR WARFARE

Established in 1998, The Center on Terrorism and Irregular Warfare conducts research on domestic and international terrorism and other forms of irregular warfare. The center places special emphasis on analysis of special operations and support of the special operations community

INFORMATION OPERATION CENTER OF EXCELLENCE (IOCE)

Specialist assigned to an information operations position, and generalist who will be assigned to conduct information operations, work with defense analysis researchers to understand the human dimension of warfare (psycho-social), analytical methods and atypical sequences.

SPACE SYSTEMS ACADEMIC GROUP (SSAG)

The SSAG serves as the focal point for all space-related research performed at NPS. Researchers couple NPS space research efforts with graduate education that includes the creation of small satellites.

CENTER FOR INFORMATION SYSTEMS SECURITY STUDIES AND RESEARCH (CISR)

CISR classes and research examine the problem of malicious software and system subversion. Students and faculty construct systems to provide enforcement for critical security policies in the face of malicious software and penetration attempts.

CENTER FOR NETWORK INNOVATION AND EXPERIMENTATION (CENETIX)

CENETIX explore the frontiers of self-organizing tactical networking and collaboration. The center provides students and faculty with opportunities for interdisciplinary study of agile, adaptive wireless networks, network-controlled unmanned vehicles, sensors, intelligent agents and situational awareness platforms.

CENTER FOR ELECTRONIC WARFARE

NPS is answering the challenges of modern electronic warfare by conducting cutting-edge research in everything to electronic surveillance systems, laser and radar cross section engineering, atmospheric modeling, RF propagation modeling, C2W mission planning, information warfare strategies, communications and radar jamming, shipboard self-protection systems, and high speed signal processing.

CENTER FOR CYBER WARFARE

The Center for Cyber Warfare is a multi-departmental research center focused on the general area of cyber warfare with emphasis on cyber attack.

CRYPTOLOGIC RESEARCH

Cryptography allows for confidential information transmission over untrusted networks as well as the ability to prove the origin of messages. It is a technology that is critical in an online world.

MEYER DEFENSE SYSTEM INSTITUTE

The Meyer Institute provides NPS faculty and students with relevant, tailored, and unique research opportunities in systems engineering and designated warfare areas to support NPS graduate education that increases the combat effectiveness of U.S. and allied armed forces and enhances the security of the United States.

CENTER FOR BALLISTIC MISSILE DEFENSE

Ballistic missile defense development is a front-burner issue for homeland defense and the defense of U.S. and coalition forces abroad. NPS researchers are working to find innovative, multidisciplinary missile defense solutions.

CENTER FOR RENEWABLE ENERGY

NPS actively seeks to be a leader in the defense arena in energy research. NPS researchers are working to create sustainable energy technologies as part of the Navy's vision of a more efficient, "green fleet."

THE SIMULATION EXPERIMENTS AND EFFICIENT DESIGN (SEED) CENTER

The SEED Center seeks to advance the state-of-the-art in conducting large-scale simulation studies, by developing and disseminating experimental designs that facilitate the exploration of complex simulation models. Ongoing application areas include studies on peacekeeping, technical and human aspects of warfare, adaptive asymmetric adversaries, homeland security and networked future forces.

NAVAL POSTGRADUATE SCHOOL

WWW.NPS.EDU

OVERVIEW

The Naval Postgraduate School provides relevant and innovative advanced education and research to increase the combat effectiveness and security of the United States and allied nations around the world. NPS' vision is to be the world's leader in naval and defense-related graduate education, prepare the intellectual leaders of tomorrow's armed forces with the tools needed to keep the world secure. Built upon an institutional focus of progressive excellence, relevance and uniqueness of program research, global and community outreach, and information and technological superiority, NPS is an established world-class academic community.

More than 2,000 students are enrolled in NPS degree programs each year. Nearly half are officers from the U.S. Navy and Marine Corps, with significant representation from other U.S. armed forces and DOD agency civilians studying side-by-side with over 200 international officers from more than 40 nations. These students are the world's military and civilian leaders of tomorrow, and have been selected to study in NPS' degree and certificate programs, as well as globe-spanning mobile education teams. These programs demonstrate the ability of NPS to quickly respond to emerging needs of national security, bringing the intellectual capital of highly respected faculty to bear upon new challenges.

The NPS faculty, the majority of whom are civilians, are drawn from a broad diversity of educational institutions and represent a prestigious collection of scholars. Faculty and student interaction is high with every class taught directly by a faculty member.

LOCATION

Located in beautiful Monterey, on the California Central Coast, 120 miles south of San Francisco, the NPS campus covers 627 acres along the Pacific Ocean. NPS features state-of-the-art laboratories, academic classrooms and research spaces, an outstanding library, government housing and impressive recreational facilities. [Earning a degree at the Naval Postgraduate School delivers tremendous benefits of one of the country's most beautiful places with outstanding quality of living.]

HISTORY

The idea for a graduate education and research program for U.S. naval officers first emerged in the late 1800s. With Marconi's invention in 1901 of long distance radio transmissions, the Wright brothers inventing and building the world's first successful airplane in 1903, and the steam powered White Fleet that circumnavigated the globe from 1907–1909 under a watchful President Theodore Roosevelt, graduate education for U.S. naval officers began to gain support. On June 9, 1909, Secretary of the Navy George von L. Meyer established a school of marine engineering at Annapolis, Md. with the signing of General Order No. 27. The first class, consisting of just 10 officers with two Navy instructors began a scholastic journey lasting over 100 years, moving from Atlantic to Pacific coasts, gaining curricula and enrollment to become one of the most respected naval research universities in the world. The Naval Postgraduate School celebrated its centennial anniversary in 2009 with a renewed outlook on future research in fields of special operations, energy efficiency and cybersecurity.

ADMISSIONS

NPS offers several degree, certificate, distance learning and short course programs. Each school has its own admissions criteria. Minimum qualifications include an accredited baccalaureate degree with appropriate preparation for the proposed program and submission of official transcripts covering all college work completed to date. For NPS admissions information or to apply online, visit www.nps.edu

ADMISSION ELIGIBILITY

Military officers and government civilian employees from other countries may be admitted to most curricula. Correspondence must be processed through official channels. The procedures for application are available from the Security Assistance Office or Defense Attaché Office of the U.S. Embassy, the MLO, MAAG, OMC or ODC, as appropriate.

All candidates must satisfy curriculum academic standards. International candidates from non-English speaking countries will also be required to validate their fluency in English through the Test of English as a Foreign Language (TOEFL). Minimum TOEFL score required for direct entry to NPS is 83 IBT (Internet Based Test) and 560 WT (Written Test). Candidates for Ph.D. Programs or Accelerated Programs need to score at least 100 IBT. Waivers will be considered on a case-by-case basis for scores between 90–100. Candidates applying for the Department of National Security Affairs need to score at least 90 IBT.

Candidates who fail to achieve an 83 IBT and 560 WT, but score at least 70 IBT and 523 WT, will be eligible to attend a 16-week TOEFL Preparatory Academic Writing Course at the Defense Language Institute in San Antonio, Texas.

The NPS identification code for TOEFL exams is 4831. This code should be included on the registration application so a copy of the results can be sent directly to NPS. TOEFL test results are valid for two years from the test date and must be valid when the student reports to NPS.

Further questions regarding available programs, requirements and admission procedures should be directed to Code 04IGP, 1 University Circle, Rm B-047, Naval Postgraduate School, Monterey, CA 93943-5025. Telephone: (831) 656-2186 or visit: www.nps.edu/Adminsrv/IGPO/index.html.

ACADEMIC REQUIREMENTS

Academic requirements are straightforward and simple. All students accepted for admission must possess, at a minimum, a baccalaureate degree or equivalent. This

course work must have been completed at a recognized university or college with a grade point average of at least C+ (2.20 on a 4.0 scale). For candidates applying for entry into the Department of National Security Affairs, a grade point average of 2.6 is required. For technical or engineering programs, successful completion of calculus and calculus-based physics must be documented as well. The Business School degree programs (MBA's) and Special Operations curricula require successful completion of college level algebra.

ENGLISH AS A SECOND LANGUAGE PROGRAM

NPS has an established on-campus English as a Second Language (ESL) program where instructors on staff teach both a speaking and writing course. The ESL instructors also conduct speaking and listening proficiency interviews with each incoming international student to determine the individual's need to attend the course.

THE GRADUATE SCHOOL OF BUSINESS AND PUBLIC POLICY DEGREES

Executive Master of Business Administration

Master of Business Administration

Master of Executive Management

M.S. Contract Management

M.S. Management

M.S. Program Management

THE GRADUATE SCHOOL OF ENGINEERING AND APPLIED SCIENCES DEGREES

Astronautical Engineer's Degree

Electrical Engineer's Degree

Mechanical Engineer's Degree

MEng Electrical Engineering

M Engineering Acoustics

Masters of Science:

Applied Mathematics

Applied Physics

Applied Science (Acoustics)

Applied Science (Operations Research)

Applied Science (Physical Oceanography)

Applied Science (Signal Processing)

Astronautical Engineering

Combat System Technology

Computer Engineering

Computer Science

Electrical Engineering

Engineering Acoustics

Engineering Science

Engineering Science (Astronautical Engineering)

Engineering Science (Electrical Engineering)

Engineering Science (Mechanical Engineering)

Engineering Systems

Meteorology and Physical Oceanography

Mechanical Engineering

Meteorology

Physical Oceanography

Physics

Operations Research

Space Systems Operations

Systems Engineering

Systems Engineering Management

Product Development

MSME Mechanical Engineering

Doctors of Philosophy:

Applied Mathematics

Applied Physics

Astronautical Engineering

Electrical Engineering

Engineering Acoustics

Mechanical Engineering

Meteorology

Physical Oceanography

Physics

Systems Engineering

Systems Engineering Management

THE GRADUATE SCHOOL OF OPERATIONAL AND INFORMATION SCIENCES DEGREES

B.S. Computer Science

M Computer Technology

M Cost Estimating and Analysis

M Human Systems Integration

M Systems Analysis

M.A. Identity Management and Cyber Security

M.A. National Security Affairs

Masters of Science:

Applied Science (Operations Research)

Computer Science

Cyber Systems and Operations

Defense Analysis

Electronic Warfare Systems Engineering

Human Systems Integration

Information Operations

Information Systems and Operations

Information Technology Management

Information Warfare Systems Engineering

Modeling Virtual Environments and Simulation

Operations Research

Remote Sensing Intelligence

Software Engineering

Systems Technology (Cmd, Ctrl, Comm.)

Systems Engineering Analysis

MSA Master of System Analysis

Doctors of Philosophy:

Computer Science

Information Sciences

Modeling Virtual Environments and Simulation

Operations Research

Software Engineering

THE SCHOOL OF INTERNATIONAL GRADUATE STUDIES DEGREES

M.A. Security Studies (Europe and Eurasia; Far East, SE Asia, the Pacific; Mid East, S Asia, Sub-Saharan Africa; Western Hemisphere; Civil-Military Relations; Combating-Terrorism: Policy and Strategy; Defense Decision-Making and Planning; Homeland Security and Defense; Stabilization and Reconstruction)

Ph.D. Security Studies

OTHER DEGREES

M.S. Systems Engineering Analysis

Ph.D. Systems Engineering Analysis

INTERNATIONAL GRADUATE
PROGRAMS OFFICE

NAVAL POSTGRADUATE SCHOOL

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